



Armed Forces College of Medicine AFCM



Non-gonococcal Urethritis & Candidiasis

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Intended Learning Outcomes (ILOs)



1. Discuss non-gonococcal urethritis
2. Outline laboratory diagnosis of non-gonococcal urethritis
3. Discuss lymphogranuloma venereum
4. Discuss genital tract candidiasis

Non-gonococcal Urethritis (NGU)



- ❑ Inflammation of the urethra **NOT** caused by *Neisseria gonorrhoeae*.
- ❑ Symptoms: painful urination, watery discharge.
- ❑ Causes:
 - ❑ ***Chlamydia trachomatis* (the most common)**
 - ❑ *Ureaplasma urealyticum*
 - ❑ *Mycoplasma hominis*

Chlamydia: Special Characters

- Non motile coccoid bacteria
- Obligate intracellular parasites of eukaryotic cells.
- Grow on yolk sac of chick embryo or in tissue culture

***mydiae* are true bacteria and are NOT virus**

1-Have both RNA and DNA

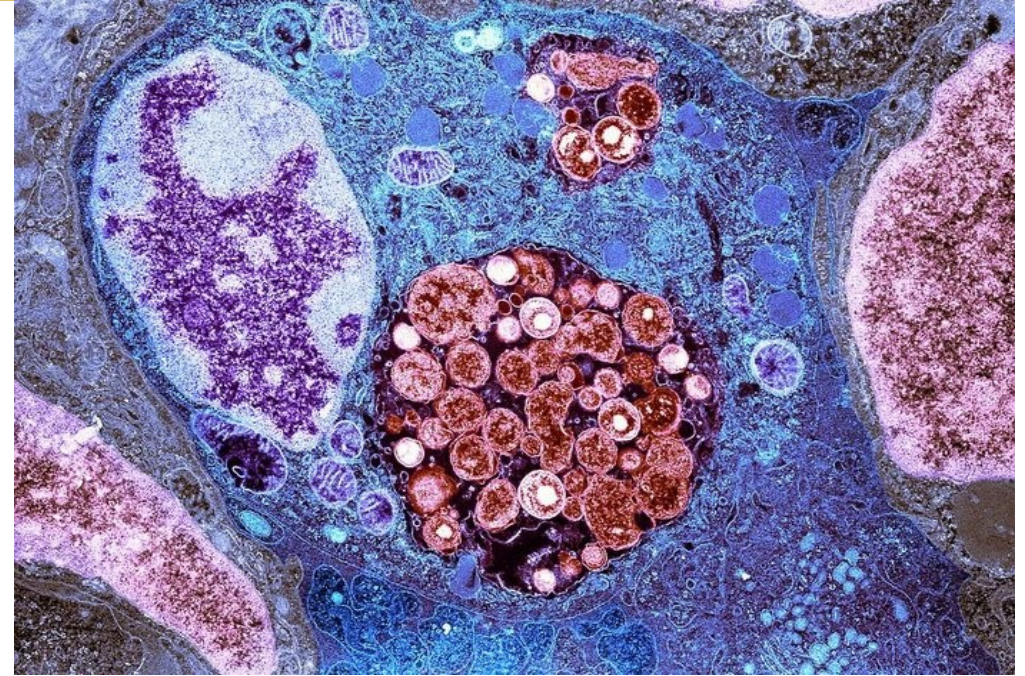
2-Sensitive to antibiotics.

3-Multiply by binary fission.

4-Posses ribosome.

5-Their cell wall is like the cell wall of Gram-negative bacteria, with no peptidoglycan.

6- Stained with Giemsa's or Leishman's stain

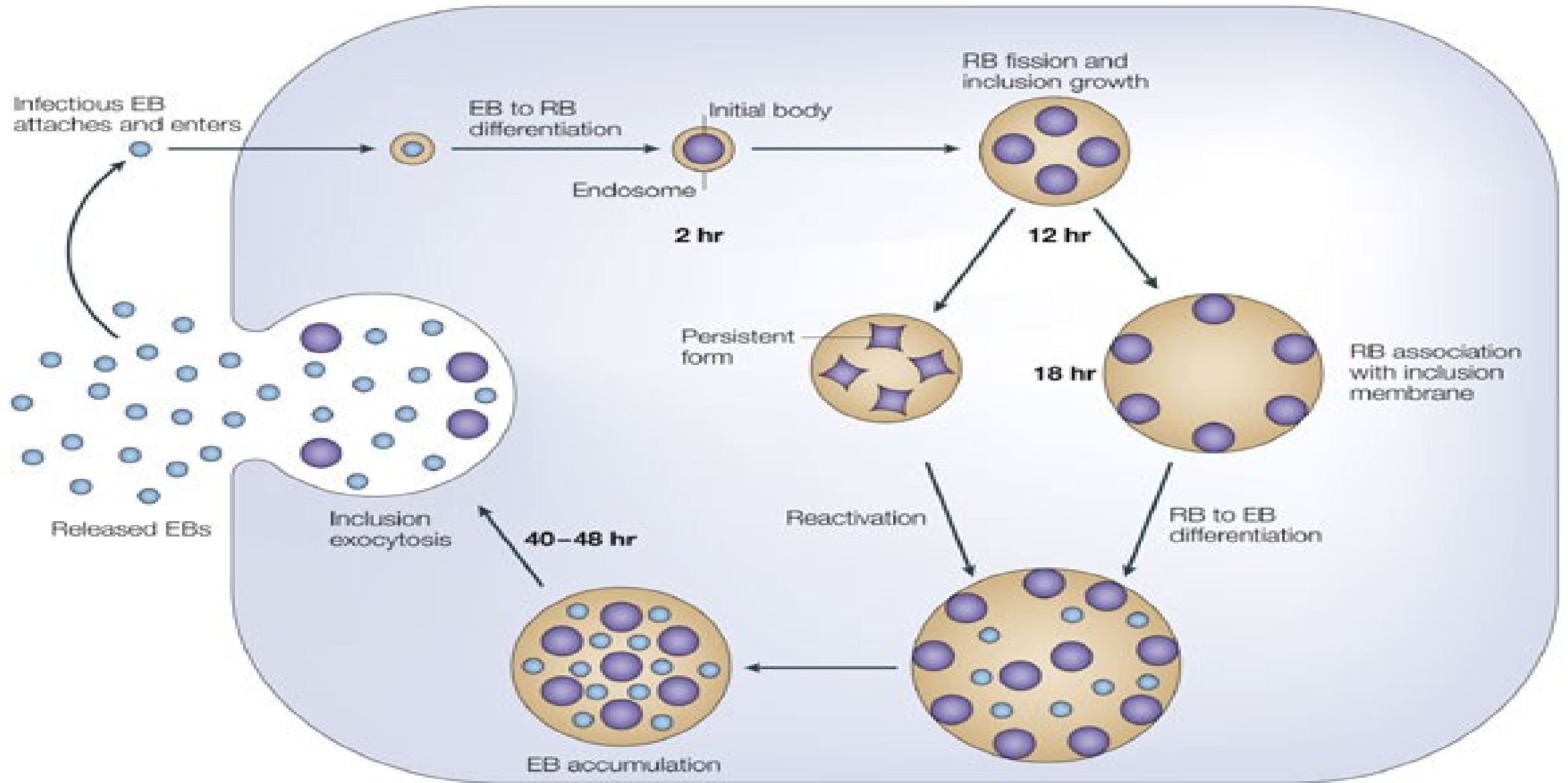


Reproductive Cycle of *Chlamydiae*



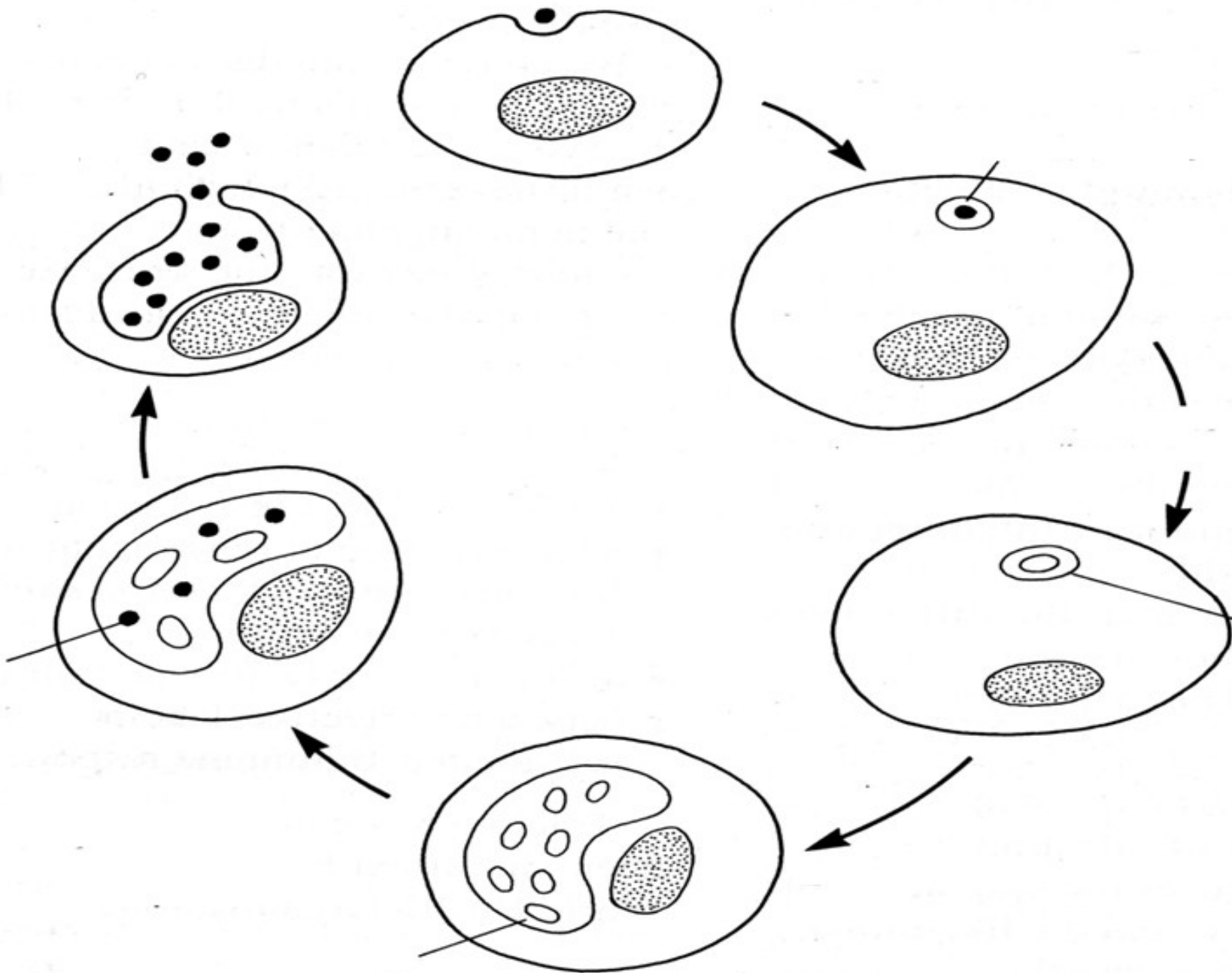
All Chlamydiae have a common reproductive cycle which differs from that of all other bacteria:

- An extracellular, metabolically inert, "spore like" small elementary body (EB) enters the cell and converted into a larger, metabolically active reticulate body (RB).
- RB → binary fission to form daughter elementary bodies, which are released from the cell.





Can you
label this
diagram?



Species of Chlamydiae

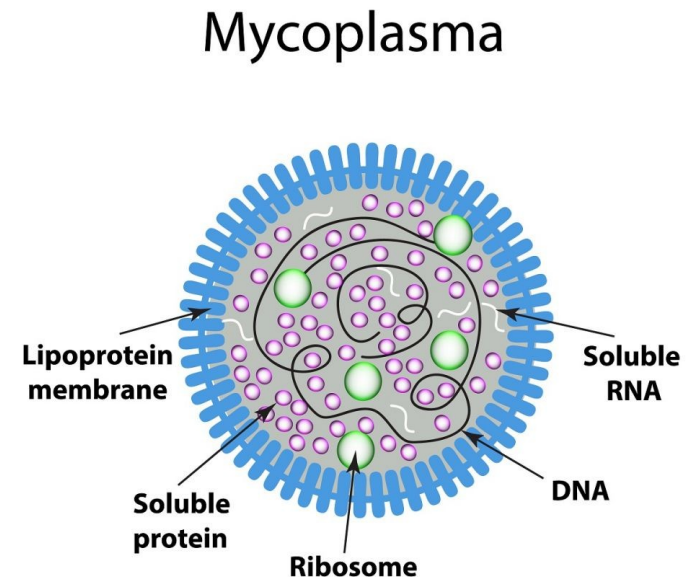


- ***Chlamydia trachomatis***
- ***Chlamydia pneumoniae***
- ***Chlamydia psittaci***

Mycoplasma



- The smallest free-living organisms.
- Prokaryotic cells, resemble Gram negative bacteria.
- Bound by a single membrane containing **cholesterol** but
- **lack a cell wall**



Special characters of Mycoplasma

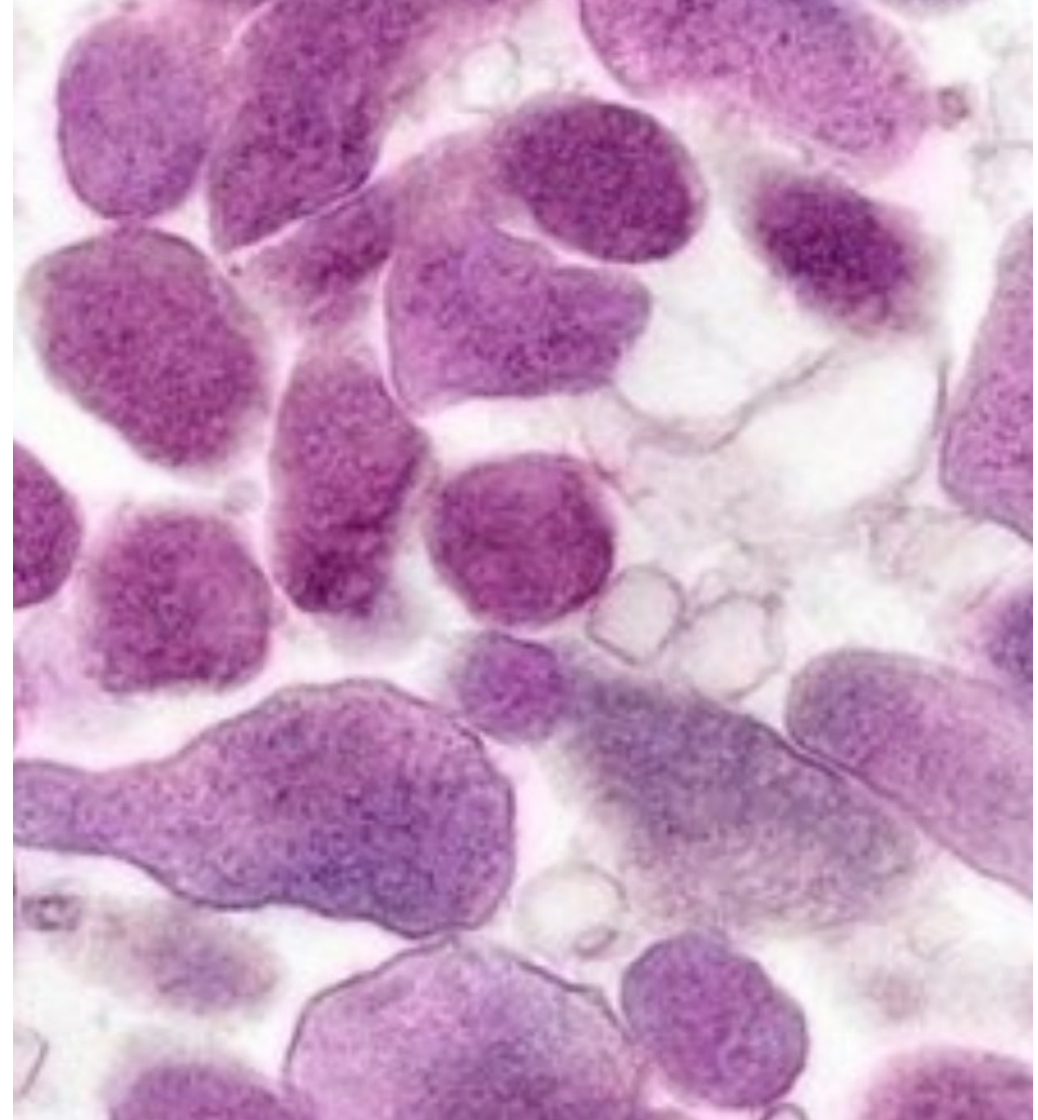


- Pleomorphic in shape
- Can't be stained by Gram stain, but stain well with Giemsa stain or leishman stain.
- Are not sensitive to antibiotics that act on cell wall e.g. β -lactam antibiotics.
- Are not destroyed by lysozymes

Mycoplasma Species



- *Mycoplasma pneumoniae* is the major pathogen.
- ***Mycoplasma hominis***
- ***Ureaplasma urealyticum***



Non-gonococcal Urethritis (NGU)



This infection may progress to

- Epididymitis, prostatitis, or proctitis, **in men**
- Cervicitis → salpingitis → PID → infertility or ectopic pregnancy, **in women**

Non-gonococcal Urethritis (NGU)



- ❑ *C. trachomatis* is the **most common cause of sexually transmitted disease**
- ❑ Types D-K cause genital tract infections, which could be transmitted to the eyes or the respiratory tract.

Take Note



Species/ Serotypes	Diseases	Transmission	Comments
<i>Chlamydia trachomatis</i> >15 (A - L)			
A, B, C	Trachoma	Contaminated hands/fomites	
D - K	Inclusion Conjunctivitis	Birth canal	
D - K	Neonatal Pneumonia	Birth canal	
D - K	Genital tract infections In men: NGU, epididymitis, prostatitis, proctitis. In women, cervicitis, salpingitis, PID	Sexually	occasionally transmitted to the eyes or the respiratory tract
L1 - L3	Lymphogranuloma venereum	Sexually	lesions on genitalia and in lymph nodes
<i>Chlamydia pneumoniae</i> 1 serotype	Atypical pneumonia	Respiratory droplet	<i>C. pneumoniae</i> infects only humans and is transmitted from person to person by aerosol
<i>Chlamydia psittaci</i> 1 serotype	Psittacosis	Inhalation of dried bird feces	<i>C. psittaci</i> infects the lungs primarily. Human psittacosis is not generally communicable

Reiter's syndrome??



- ❑ Patients with genital tract infections caused by *C. trachomatis* have a high incidence of **Reiter's syndrome ??**
- ❑ An **autoimmune** disease caused by antibodies formed against *C. trachomatis* cross-reacting with antigens on cells of the **urethra, joints, and uveal tract**
- ❑ Characterized by:
 - ❑ **Urethritis, arthritis, uveitis**

Lab diagnosis of Chlamydia infections



- I. Cytology**
- II. Antigen Detection**
- III. Nucleic Acid-Based Tests**
- IV. Culture**
- V. Antibody Detection**

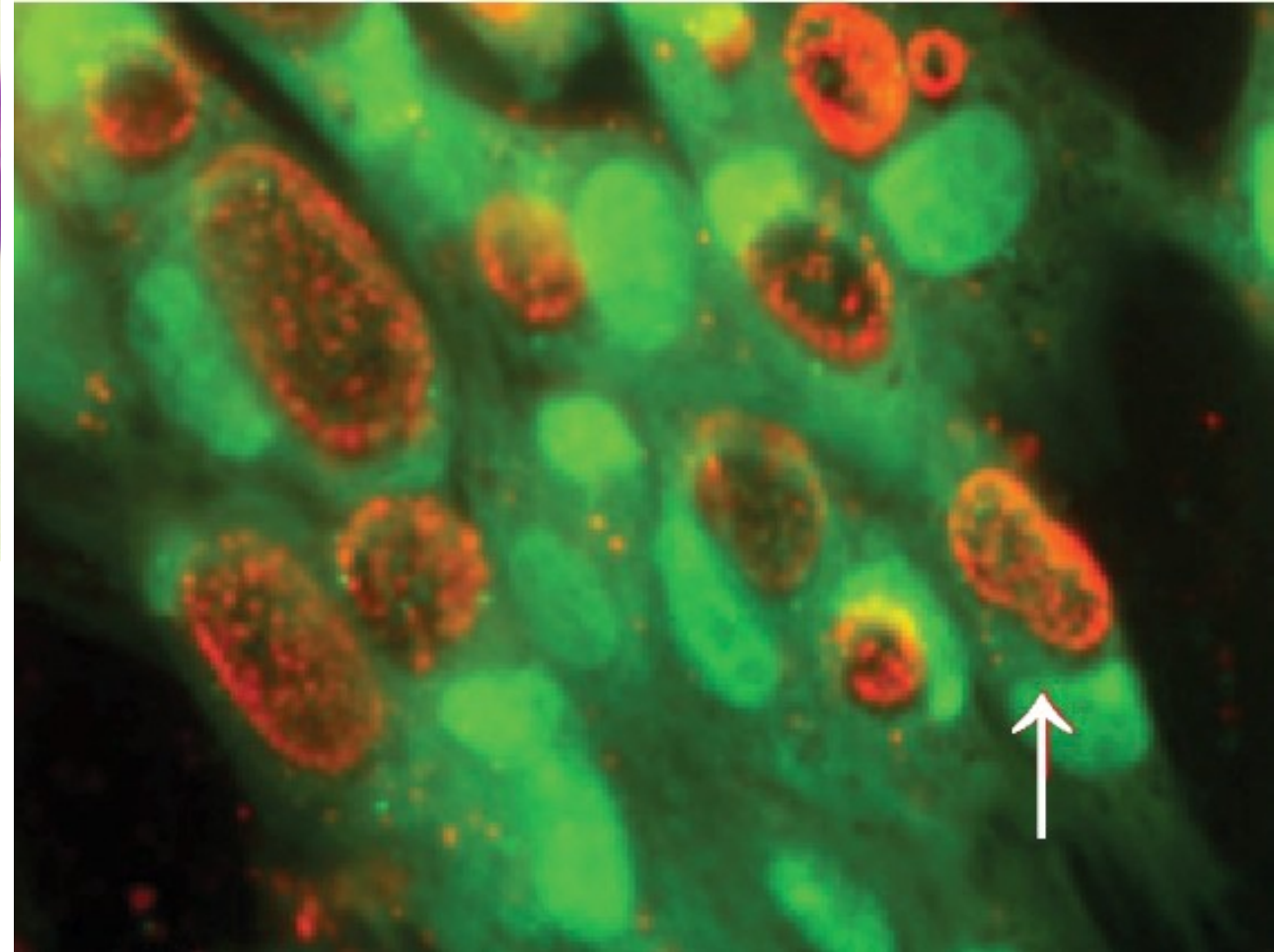
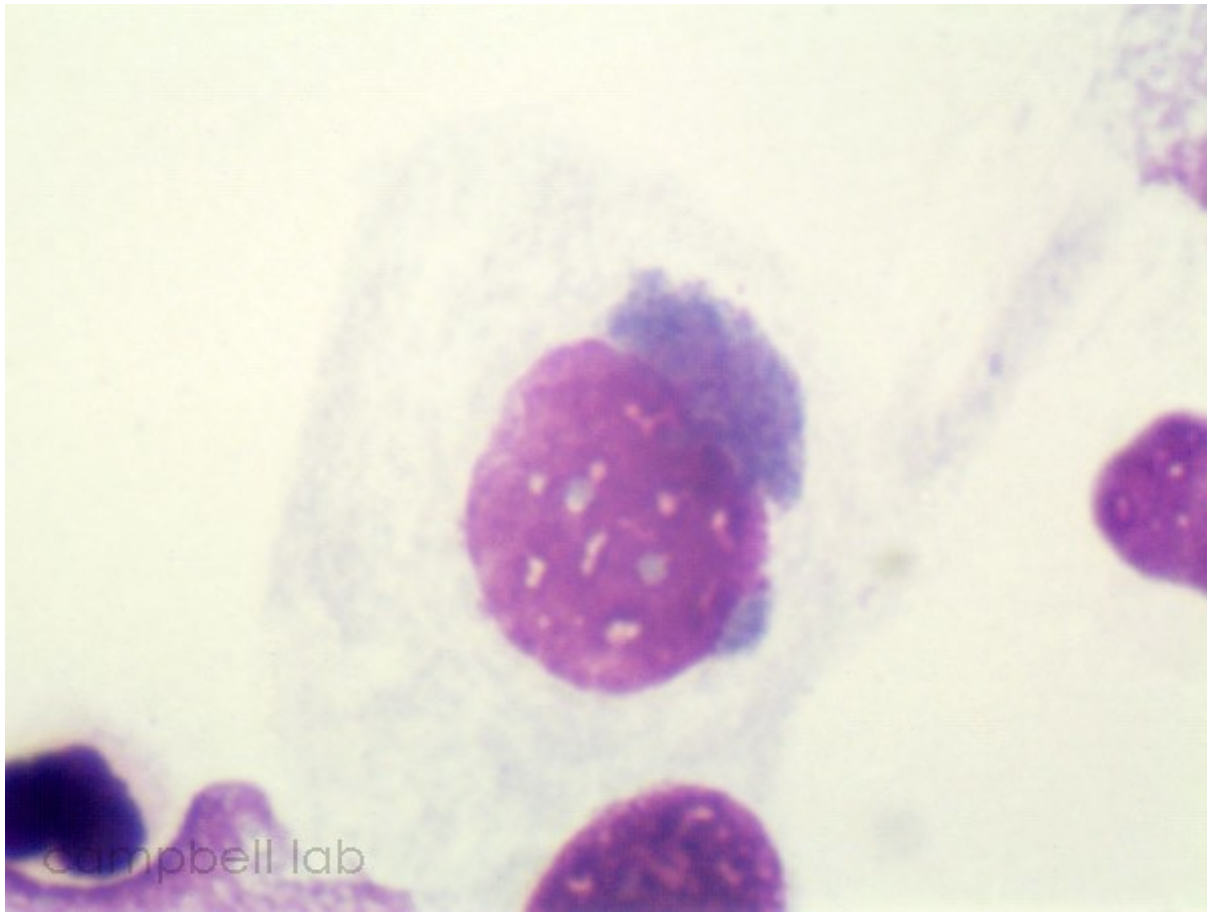
Lab diagnosis of Chlamydia infections



I. Cytology

Chlamydiae form cytoplasmic inclusions, which can be seen in direct smears stained with special stains (e.g., Giemsa stain) or by immunofluorescence.

The Gram stain is not useful



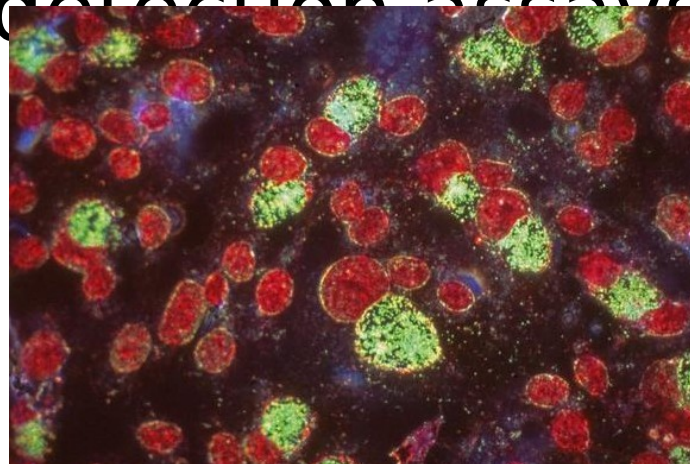
Lab diagnosis of Chlamydia infections



II. Antigen Detection

Chlamydial antigens can be detected in exudates or urine by

- ❑ Direct immunofluorescence Staining
- ❑ ELISA.
- ❑ Rapid antigen detection assays



Lab diagnosis of Chlamydia infections



III. Nucleic Acid-Based Tests

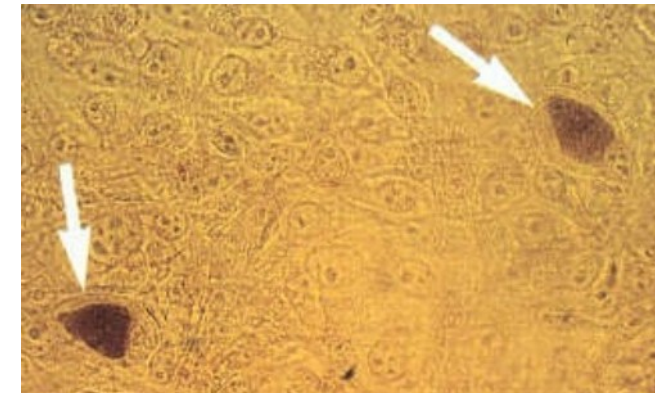
❑ Nucleic acid amplification tests (NAATs) using the patient's urine are widely used to diagnose chlamydial STD.

Lab diagnosis of Chlamydia infections



IV. Culture

- ❑ Chlamydiae can be grown in **cell cultures**
- ❑ *C. trachomatis* forms inclusions containing glycogen, whereas *C. psittaci* & *C. pneumoniae* form inclusions that do not contain glycogen.
- ❑ The glycogen-filled inclusions are visualized by staining with **iodine**.



Lab diagnosis of Chlamydia infections



VI. Antibody Detection !!

- ❑ Serologic tests are used to diagnose infections by *C. psittaci* & *C. pneumoniae*
- ❑ but are of **limited value** in diagnosing most disease caused by *C. trachomatis* because *the* frequency of infection is so high that many people already have antibodies.

Prevention



- ❑ There is no vaccine against any chlamydial disease.
- ❑ The best preventive measure against *C. trachomatis* STDs is to limit transmission by:
 - Prompt treatment of **BOTH** the patient and the sexual partners, including persons who are asymptomatic.

Prevention



- ❑ Sexual contacts should be traced, and those who had contact within 60 days should be treated.
- ❑ Several types of STDs are often present simultaneously.
- ❑ Thus diagnosis of one requires a search for other causative agents.

Ureaplasma urealyticum



- ❑ Cause urethritis and infertility
- ❑ *Ureaplasma urealyticum* may cause approximately 20% of cases of NGU.
- ❑ A member of the **mycoplasmas** (bacteria without a cell wall).
- ❑ Ureaplasmas can be distinguished from mycoplasmas by their ability to produce the enzyme urease

Mycoplasma hominis



- *Mycoplasma hominis* commonly inhabits the normal vagina but can opportunistically cause uterine tube infection.

Quiz



Your patient is a 20-year-old man with a urethral discharge. Gram stain of the pus reveals many neutrophils but no bacteria. Which one of the following organisms is the MOST likely cause?

- (A) *Treponema pallidum*
- (B) *Haemophilus ducreyi*
- (C) *Mycobacterium marinum*
- (D) *Candida albicans*
- (E) *Chlamydia trachomatis*

Lymphogranuloma Venereum (LGV)



- ❑ Caused by serovars of ***C. trachomatis* (L1-L3)** that are invasive and tend to infect lymphoid tissue.
- ❑ The microorganisms invade the lymphatic system, and the regional **lymph nodes** become **enlarged and tender**.
- ❑ Suppuration (a discharge of pus) may also occur.

Lymphogranuloma Venereum (LGV)



- ❑ Inflammation of the lymph nodes → scarring → obstruction of lymph vessels → may cause massive enlargement of the external genitals in men.
- ❑ In women, involvement of the lymph nodes in the rectal region leads to narrowing of the rectum.
- ❑ These conditions may eventually require surgery.

Lymphogranuloma Venereum (LGV)



Lymphogranuloma Venereum (LGV)



❑ Infection by *C. trachomatis* leads to formation of antibodies and cell-mediated reactions but **NOT** to resistance to reinfection or elimination of organisms.

Quiz



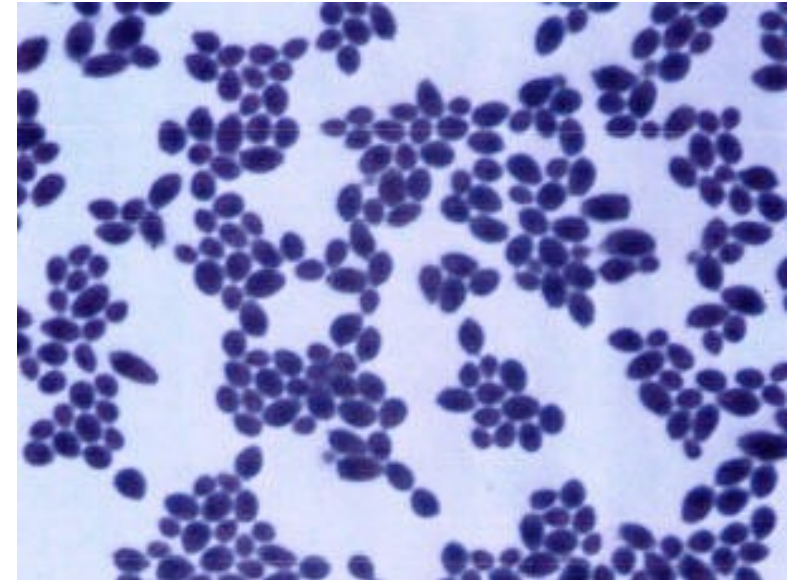
Regarding *Chlamydiae*, which one of the following is **MOST accurate?**

- (A) They are gram-positive rods that do not form spores.
- (B) They exhibit swarming motility on a blood agar plate.
- (C) Their life cycle consists of a metabolically inactive particle in the extracellular phase.
- (E) They replicate in the nucleus of infected cells, where they form inclusions that are useful diagnostically.

Candidiasis



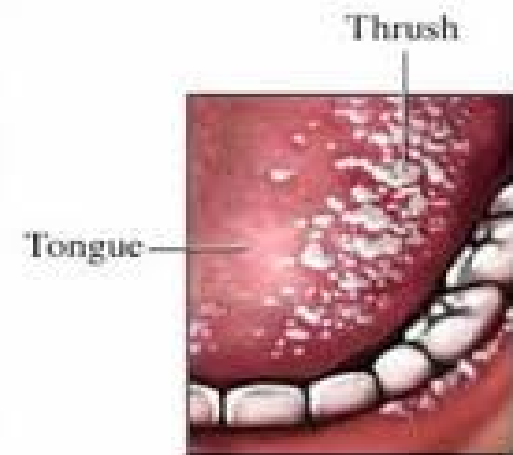
- ❑ Vaginal infections by *Candida* is very common.
- ❑ *Candida albicans* is the most common species, causing 85–90% of cases.
- ❑ Infections by other species, such as *C. glabrata*, are resistant to antifungals and tend to be chronic or recurrent.



Candidiasis



- ❑ *C. albicans* often grows on mucous membranes of the mouth, intestinal tract, and genitourinary tract
- ❑ *C. albicans* is the cause of oral candidiasis, or thrush.



Candidiasis



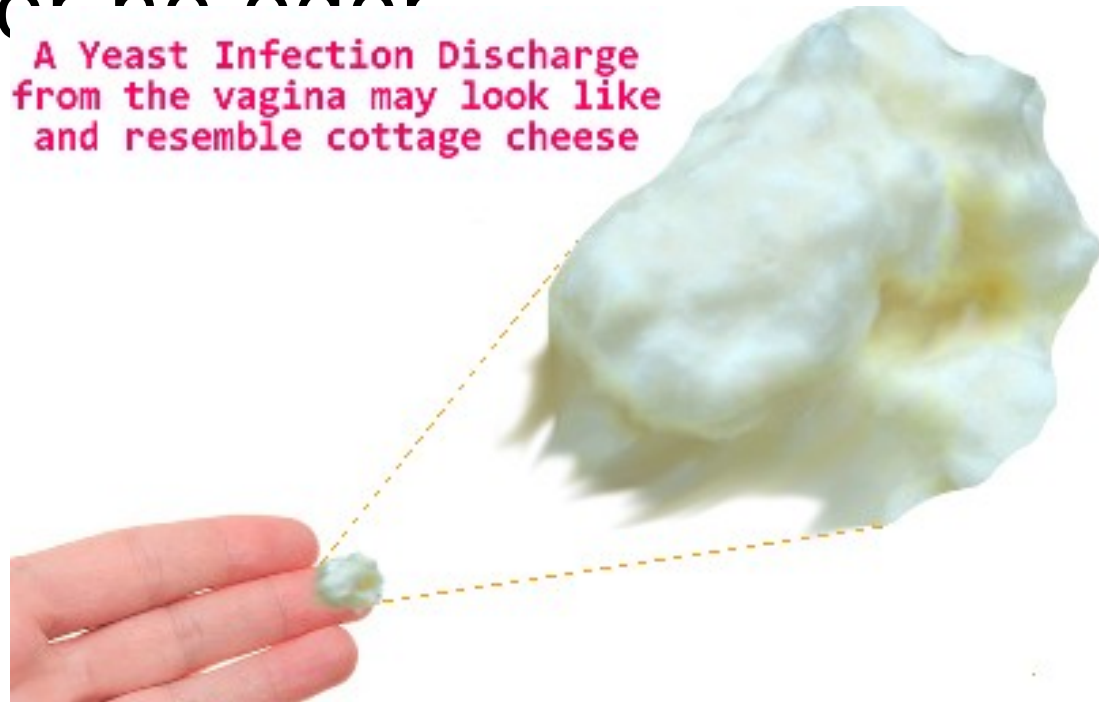
- ❑ It is responsible for occasional cases of NGU in men and for vulvovaginal candidiasis
- ❑ Infections are usually a result of **opportunistic overgrowth** when the competing **commensals** are suppressed by antibiotics or other factors.

Candidiasis



❑ The lesions of vulvovaginal candidiasis produce irritation: severe itching; a thick, yellow, cheesy discharge; and yeasty or bread odor

A Yeast Infection Discharge from the vagina may look like and resemble cottage cheese



Candidiasis



Predisposing conditions include

- Hormonal contraceptives and pregnancy, which cause an increase of glycogen in the vagina.
- Candidiasis is much less common in girls before puberty or in women after menopause.
- Uncontrolled Diabetes Mellitus
- Prolonged use of broad-spectrum antibiotics



Thank
you